ABSTRACT

III-NITRIDE SEMICONDUCTOR LIGHT EMITTING DEVICE

The present invention relates to a III-nitride semiconductor light emitting device comprising a plurality of III-nitride semiconductor layers including an active layer emitting light by recombination of electrons and holes, the plurality of III-nitride semiconductor layers having a p-type III-nitride semiconductor layer at the top thereof, an $Si_aC_bN_c$ ($a\geq0,b>0,c\geq0,a+c>0$) layer grown on the p-type III-nitride semiconductor layer, the $Si_aC_bN_c$ ($a\geq0,b>0,c\geq0,a+c>0$) layer having an n-type conductivity and a thickness of 5Å to 500Å for the holes to be injected into the p-type III-nitride semiconductor layer by tunneling, and a p-side electrode formed on the $Si_aC_bN_c$ ($a\geq0,b>0,c\geq0,a+c>0$) layer. Generally, in III-nitride semiconductor light emitting devices, if a p-side electrode is formed directly on a p-type nitride semiconductor, high contact resistance is generated due to a high energy bandgap and low doping efficiency of the p-type nitride semiconductor. This makes the efficiency of the device degraded. According to the present invention, however, a $Si_aC_bN_c$ ($a\geq0,b>0,c\geq0,a+c>0$) layer which can be doped with a high concentration is intervened between a p-type nitride semiconductor and a p-side electrode. Therefore, the present invention can solve the conventional problem.